

**CARBONATED SOFT DRINK PACKAGING**

**ANALYSIS IN ONTARIO**

**EMPLOYMENT MODEL**

**AN EVALUATION OF THE EMPLOYMENT IMPACTS**

**FOR**

**SEVEN POLICY ALTERNATIVES**

**PRINCIPAL REPORT**

**DECEMBER 1977**

MOE  
CAR  
APXZ



Ontario  
Waste Management  
Advisory Board

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## OUTLINE OF EMPLOYMENT MODEL

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## INTRODUCTION

Seven policy alternatives, which were intended to reduce environmental impacts associated with non-refillable carbonated soft drink bottles and cans, were evaluated for possible Ontario adoption. The objective function in this report is to assess the direct and indirect employment impacts associated with each of the seven policy alternatives, including the integrated policy package which has been selected by the Ontario Government.

Environmental gains will occur when sales of carbonated soft drinks in refillable bottles are substituted for sales in throwaway bottles and cans. This container substitution will cause job dislocations in the two container manufacturing industries which should be phased over a reasonable adjustment period. New jobs will, however, be created in the distribution sector during the policy transformation period.

When the direct job gains in the distribution system by bottlers and retailers are set against the number of expected job losses for production workers in the container industries, the transformation to an increasingly refillable system would become job creative. New jobs, of a low skilled nature, are required to handle an increased flow of refillable bottles which are returned by consumers for deposit refund.

In addition to the estimates of the labour impact in the container manufacturing, bottling and retail sectors associated with each of the seven policy alternatives, estimates are also included for the more uncertain indirect job linkages.

The appendices to this report provide additional details on methodology, computations and assumptions which were used in the derivation of the employment impacts. In some instances, alternative methods were available. In these situations, the more conservative approach was usually selected, i.e., the approach which led to a forecast of fewer net job gains.

The estimated employment impacts are summarized in the four principal tables, Tables E1 to E4 for both the direct and indirect employment components for each policy alternative.

In the first two tables, the expected employment impact in the first year of each policy alternative is presented. The next two tables relate exclusively to the estimated number of production worker job losses in the two container industries for the complete transformation period for each policy alternative.

The first-year employment estimates in Table E5 indicate the impacts derived from three model modifications that were evaluated for the Government's policy package. These modifications refer to changes in the trippage level in the model, to changes in the method of computing the job increase component in the distribution sector, and to the possible introduction of a handling charge by the retail sector for returned refillable bottles.

As indicated earlier, this report deals exclusively with the estimated employment impacts for the seven policy alternatives. The employment impact derived in this report must be integrated with the associated environmental impacts, which are evaluated in a separate report, before a particular policy alternative can be selected as the optimal candidate.

One final introductory comment is important. When container substitution occurs from cans and throwaway bottles to refillable bottles, there will be job losses in the container production industries. Production worker employees who lose their jobs will be high skilled with high wages and centrally located at a small number of urban plant sites in the two container industries. The latter will not be candidates for the increased number of lower skilled, lower wage jobs that will be expected across Ontario in the distribution sector. Consideration of financial and technical assistance to employees who are displaced because of the introduction of environmental policies is an important concern. Its resolution, however, is outside the terms of reference for this study.

Finally, statistical input which supports the five principal tables in this study is presented in the several appendices which are identified at the end of this study.

II

EXECUTIVE SUMMARY

A. Introduction

This report analyzes the employment changes in Ontario that would be expected, particularly in the first year adjustment, for each of seven policy alternatives (including the government's policy package) that have been evaluated for carbonated soft drink packaging.

B. Findings

1. When the direct and indirect employment effects are integrated, net employment increases are predicted in the first year for each of the five primary policy alternatives.
2. When only the direct employment effects are evaluated, net employment increases are also forecast in the first year for each of the five primary policy alternatives.
3. The greatest net employment gains in the first year (either for the overall net employment impact or for the net direct employment impact) occur in the two policy alternatives which require the largest container shift from single drink cans to single drink refillables; concomitantly, these two policy alternatives would cause the largest level of unemployment in the metal container industry. These programs are BAN and MAND(RET).
4. In the two phased policy alternatives (POL PACK and BAN(PH)), there is a distinctly smaller but definite net increase in employment expected (both for the overall employment and for the direct employment assessments). Additional employment adjustments would continue in the future years for each of these programs.
5. Production worker job losses in the container industries refer to relatively skilled, high income wage earners. These job losses would be concentrated in a small number of urban areas where the container plants exist. The

job increases in the distribution sector relate to low skilled, low wage employees who would be hired in regions across the province.

6. Under each policy alternative, the total number of production work job losses in the two container industries is almost identical, although the distribution between these two industries is a function of the expected market shift from cans to single drink refillables required by each policy alternative.
7. According to estimates presented from the Glass Container Council of Canada, the majority of the expected job dislocations under POL PACK has already been experienced. The unemployment estimates presented in this report have not <sup>been</sup> adjusted to reflect the unemployment that has already occurred in the glass container industry.
8. Employment studies in other jurisdictions confirm that policy action on throwaway beverage containers is job creative.
9. Before a final evaluation on policy alternatives is possible, the results of the employment model must be integrated with the complementary assessment of the environmental and other goals established by the government for carbonated soft drink packaging in Ontario.

#### Background

Just over a decade ago, almost all sales of carbonated soft drinks in Ontario were in refillable bottles. According to recent estimates, which were applicable before the impact of the government's program was started, only 40% of the total gallonage sales of carbonated soft drinks were in refillable bottles; 40% was in cans and 20% in throwaway glass bottles. In the single drink size, the pre-policy market share was: refillable bottles 16%, cans 80% and, throwaway glass bottles 4%. Gallonage sales in the single drink size is about 50% of the total gallonage sales.

The Ontario government has introduced an integrated policy package for carbonated soft drink packaging which is intended to reduce solid waste and litter and conserve resources including energy. The intention of the government's policy package is to increase the use and reuse of refillable bottles (and therefore to deter the sale of carbonated soft drinks in throwaway bottles and cans). A significant container shift is also required in the single drink size: i.e., the share of gallonage sales in cans must fall significantly to about 50% of its present share. This latter goal is of fundamental importance in the government's policy package.

Any action taken to achieve a greater use of the environmentally more efficient refillable bottle will introduce employment gains in the distribution system and concomitantly employment losses in the container manufacturing (and support) industries. It is also an important government concern that the job losses in the two container industries be phased over a reasonable adjustment period.

#### Definition of Policy Alternatives

Before the government adopted its policy package<sup>1</sup> a number

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<sup>1</sup>The principal elements of the government's policy package for carbonated soft drink packaging are: mandatory availability of refillable bottles in retail outlets by flavour and by size (effective April 1, 1977); a ban on non-refillable bottles (to be effective April 1, 1978); a 5-cent can tax (on the Order Paper); a ban on detachable easy opening devices for cans (effective July 1, 1977), and the development of three sizes of standard interchangeable refillable bottles for voluntary industry use. As a result of the government's policy, some container shifting has already occurred (particularly a decline in throwaway bottles and an increase in the share of refillables) and therefore much of the expected job dislocation has already been experienced by the glass container industry.

of alternative policy programs were evaluated on an environmental and an economic basis. In this report the estimated total sector employment adjustments for seven government policy alternatives for the regulation of the sale of carbonated soft drinks in non-refillable containers are presented. Of these seven policy alternatives, five have been deemed to be primary policy alternatives as they are the ones that were the most feasible and therefore were the most likely to be implemented by the government.

It is assumed for each of the seven policy alternatives assessed that there would be a ban or complete withdrawal of throwaway bottles; that the pre-policy market share is 40% refillables; 40% cans and 20% throwaway bottles; that the average propensity to return refillables by consumers is 90% and, in those systems where cans would be returned, the consumer return rate is 80%.

The definition and code allocated to each policy alternative appears on the accompanying page.

#### Outline of Employment Model

Estimates were made for the direct and indirect employment consequences associated with each of the seven policy alternatives on the basis of estimated gallonage sales for 1976 and on the assumption that no job adjustments had already occurred with respect to POL PACK or any other policy alternative.

Direct employment losses occur for production workers in the glass and metal container industries and direct employment increases occur for bottlers and retailers (and for bottle depots for one alternative) in the distribution system when there are container shifts from throwaway bottles and cans to refillable bottles. Employment losses in the container industries are concentrated and relate to relatively high skilled jobs. Employment gains in the distribution system

		NUMBER OF YEARS FOR PROGRAM COMPLETION	PERCENTAGE REDUCTION IN CAN SALES	
			FIRST YEAR	COMPLETED PROGRAM
<b>A. PRIMARY POLICY ALTERNATIVES</b>				
1. BAN:	An immediate ban (within one year) on the sale of carbonated soft drinks in cans	one	100%	100%
2. BAN(PH):	A phased ban (over five years) on the sale of carbonated soft drinks sold in cans whereby there would be a 20% reduction in can sales each year	five	20%	100%
3. MAND(RET):	A five-cent mandatory deposit on carbonated soft drink sales in cans with consumers returning empty cans to retail outlets (e.g., the Oregon and Vermont programs)	one	75%	75%
4. MAND(DEP):	A five-cent mandatory deposit on carbonated soft drink sales in cans with consumers returning empty cans to newly created universal depots (e.g., the Alberta program)	one	Ø	Ø
5. POL PACK:	The government's policy package which includes a five-cent tax on carbonated soft drink sales in cans (It is assumed that 50% of the impact occurs in the first year and 25% in the two following years)	three	25%	50%
<b>B. SECONDARY POLICY ALTERNATIVES</b>				
6. IND PROG:	The bottlers' program which establishes a goal of 70% for sales of carbonated soft drinks in refillable bottles (i.e., a 25% shift from cans to family sized refillables in addition to the withdrawal of throwaway bottles occurs in the second year)	two	Ø	25%
7. TWO CENTAX:	The government's policy package with a two-cent (instead of five) tax on carbonated soft drink sales in cans. (This assumes no loss in can sales)	one	Ø	Ø

\*It is assumed for each policy alternative that throwaway bottles are replaced by refillables.

are decentralized and will require low skilled classifications.

Indirect employment losses are expected to occur in support industries (e.g., the steel industry) to the container industries. Indirect employment gains are derived in the model from consumer saving related to relatively greater purchases of cheaper refillables and the net expenditure of government revenue in the options for POL PACK and the TWO CENTAX.

When alternative methods for employment estimates were available, a conservative bias was adopted, i.e., an alternative procedure which would have been more job creative was most often not included. For instance, in the case of POL PACK, a second method for deriving the employment increases in the distribution system indicated that 200 additional jobs would be created than the number presented in this report.

In addition, the estimated employment changes do not include any adjustments for industrial growth in each sector or for attrition in each company. If these adjustments were made, they would reduce the estimates of job losses in the container and container support industries.

#### Direct Employment Model (Table ES 1)

When the direct employment increases and decreases are estimated in the container manufacturing plants and in the distribution sector, the seven policy alternatives would be expected to produce the following net direct employment impact in the first full year of the policy programs:

<u>Primary Policy Alternatives</u>	<u>First Year Direct Employment Increases (Decreases)</u>	<u>Ranking</u>
	(Man Years)	
1. BAN	1495	2
2. BAN(PH)	118	5
3. MAND(RET)	1277	3
4. MAND(DEP)	2304	1
5. POL PACK	205	4

<u>Secondary Policy Alternatives</u>		
6. IND PROG	(225)	6
7. TWO CENTAX	(225)	6

The details by sector are provided in Table ES 1 (page 15).

When direct employment changes are evaluated, the labour intensive universal depot collection system (MAND(DEP)) would create the greatest number of jobs in the first year. In this policy alternative there is no expected shift from cans to refillable bottles and the employment increases are essentially paid for by consumers in higher retail soft drink prices.

The two alternative policies which are expected to cause a very sudden and extreme shift from cans to refillable bottles in one year (BAN and MAND(RET)) are the next most job creative. The two programs which are designed to allow a phased program approach (BAN(PH) and POL PACK) show relatively small job increases in the first year although additional net increases will be experienced in the following years for each program.

Therefore, the direct employment impact for each of the primary policy alternatives is the loss of jobs of relatively high skilled, well paid container production workers, which would be concentrated in a small number of Ontario plants, and the concomitant greater increase in lower paying, low skilled jobs created in all regions of the province in the

distribution sector.

The results in Table ES 1 indicate that the expected job losses for production workers in the first year for each of the seven policy alternatives is almost constant. This arises because of the unusual fact that the greatest unemployment estimate for can workers is 613 man years under the BAN and the greatest unemployment possibility for the glass workers is 618 man years which occurs under three policy alternatives: the job losses in each extreme are almost identical.

Production worker job losses are differentially allocated between the two container industries primarily depending upon the degree of container shift in the single drink market between cans and refillable bottles. The greater this shift, the greater the unemployment in the metal container industry and the lower the unemployment in the glass container industry. Employment estimates have been included for the once only establishment of an increased float of refillable bottles.

It has been reported by the Glass Container Council of Canada that most of the anticipated job losses under POL PACK have already been experienced.

Total Employment Model: Direct and Indirect Employment Effects Combined (Table ES 2)

The following outline summarizes the estimates of the total employment effect for the first year of each program alternative when the direct and indirect employment impacts are integrated:

<u>Primary Policy Alternatives</u>	<u>Estimated Total Employment</u>	<u>Ranking</u>
	<u>Increase (Decrease)</u>	
1. BAN	1421	1
2. BAN(PH)	109	5
3. MAND(RET)	1137	2
4. MAND(DEP)	536	3
5. POL PACK	518	4
 <u>Secondary Policy Alternatives</u>		
6. IND PROG	(216)	7
7. TWO CENTAX	(183)	6

Estimated employment impacts in the first year of each program on each sector are presented in Table ES 2<sup>1</sup>. The direct employment effects are identical to those in Table ES 1.

Carbonated soft drinks in refillable bottles are cheaper than those in non-refillables (except for the MAND(DEP) alternative) and this is expected to generate employment in other sectors. Indirect employment losses are anticipated in the container support industries, although in these situations the proportion of employees affected would be small in any plant and some would be retained through the process of growth and attrition. The net impact of the government's can tax is also expected to be job creative.

Net employment increases, which occur in all the primary policy alternatives can be explained by one general rule: a dollar's worth of labour lost in one sector will reappear in another sector if there are no leakages outside the territory. Skilled production workers who are well paid lose their jobs in the container shift and their income is transferred in the economy to a larger number of lower paid workers in the distribution sector.

<sup>1</sup> See page 16.

Finally, job losses are predicted in both direct employment and indirect employment for the two secondary policy alternatives.

Production Worker Job Losses for Each Policy Alternative Program (Table ES 3)

The seven policy alternatives are defined to have transformation periods from one to five years. Table ES 1 indicated direct employment losses for production workers in the container industries in the first year for each policy alternative. However, three policy alternatives (BAN(PH), POL PACK and IND PROG) have transformation periods beyond one year. The results in Table ES 3<sup>1</sup> indicate the number of production workers in the two container industries who would be expected to lose their jobs over the total program transformation period.

The number of production worker job losses in the glass container industry for each of the four policy alternatives, which are completed in one year, are higher in Table ES 3 than those presented in Table ES 1 because of jobs related to the once only increase in a refillable bottle float which worked to reduce first year job losses.

For those policy alternatives which require a significant shift in sales of carbonated soft drinks from cans to refillables the employment dislocation is least for POL PACK.

Table E3 presents an indication of the additional hardships on this group of high skilled employees who work in a small number of Ontario plants. It should also be recognized that most of the job losses forecast in the glass container industry under POL PACK have already occurred.

<sup>1</sup> See page 17.

#### Studies in Other Jurisdictions

Beverage packaging studies in other jurisdictions have uniformly concluded that when all sectors are evaluated, more jobs are created than lost. The most recent comprehensive study was undertaken by Research Triangle Institute for the Federal Energy Administration in the United States, which investigated the employment impact of a mandatory deposit system over the entire United States. The direct employment impact was the creation of about four new jobs in the distribution sector for every one job lost in the container and container support industries.

#### Final Comments

Before a cost-benefit evaluation for each policy alternative can be completed, the results in the employment model must be integrated with those in the environmental assessment investigation.

However, given the level of job dislocation which has been reported in the glass container industry and given the intention to significantly reduce the market share of carbonated soft drinks sold in cans, the government's POL PACK program, with its phased approach, would cause fewer additional job losses than any of the alternative policy options.

ESTIMATED INCREASES (DECREASES) IN DIRECT EMPLOYMENT  
IN THE FIRST YEAR FOR EACH POLICY ALTERNATIVE  
(BASED ON ONTARIO SALES 1976, ASSUMING 10 TRIPS)  
(MAN YEARS)

TABLE ES 1

	<u>PRIMARY POLICY ALTERNATIVES</u>					<u>SECONDARY POLICY ALTERNATIVES</u>	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
I. Distribution System (Bottlers and Retailers)	2095	733	1881	2922	819	393	393
II. Container Manufacturing (Production Workers)							
i) Glass	13	(492)	(144)	(618)	(461)	(618)	(618)
ii) Metal	(613)	(123)	(460)	Ø	(153)	Ø	Ø
SUB TOTAL	(600)	(615)	(604)	(618)	(614)	(618)	(618)
III. TOTAL	1495	118	1277	2304	205	(225)	(225)
	==	==	==	==	==	==	==
IV. Rank in Order of Total Employment Increases	(2)	(5)	(3)	(1)	(4)	(6)	(6)

NOTE: DECREASES IN EMPLOYMENT ARE EXPRESSED IN BRACKETS

ESTIMATED INCREASES (DECREASES) IN TOTAL EMPLOYMENT  
IN THE FIRST YEAR FOR EACH POLICY ALTERNATIVE  
(BASED ON ONTARIO SALES, 1976, ASSUMING TEN TRIPS)  
(MAN YEARS)

TABLE ES 2

	<u>PRIMARY POLICY ALTERNATIVES</u>					<u>SECONDARY POLICY ALTERNATIVES</u>	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
<b>I. DIRECT EMPLOYMENT EFFECTS</b>							
a) Distribution System (Bottlers and Retailers)	2095	733	1881	2922	819	393	393
b) Container Manufacturing (Production Workers)							
Glass	13	(492)	(144)	(618)	(461)	(618)	(618)
Metal	(613)	(123)	(460)	Ø	(153)	Ø	Ø
SUB TOTAL	(600)	(615)	(604)	(618)	(614)	(618)	(618)
c) Direct Employment Increases (Decreases)	<u>1495</u>	<u>118</u>	<u>1277</u>	<u>2304</u>	<u>205</u>	<u>(225)</u>	<u>(225)</u>
<b>II. INDIRECT EMPLOYMENT EFFECTS</b>							
a) Consumer Sector	621	321	441	(1529)	341	248	248
b) Tax Revenue Outlay	n/a	n/a	n/a	n/a	325	n/a	33
c) Support Workers for Container Mfg.	(695)	(330)	(581)	(239)	(353)	(239)	(239)
d) Indirect Employment Increases (Decreases)	<u>(74)</u>	<u>(9)</u>	<u>(140)</u>	<u>(1768)</u>	<u>313</u>	<u>9</u>	<u>42</u>
<b>III. TOTAL EMPLOYMENT INCREASES (DECREASES)</b>	<u>1421</u>	<u>109</u>	<u>1137</u>	<u>536</u>	<u>518</u>	<u>(216)</u>	<u>(183)</u>
<b>IV. RANK IN ORDER OF TOTAL EMPLOYMENT INCREASES</b>	(1)	(5)	(2)	(3)	(4)	(7)	(6)

ESTIMATED DECREASES IN EMPLOYMENT  
FOR PRODUCTION WORKERS IN CONTAINER INDUSTRIES  
FOR EACH POLICY ALTERNATIVE

TABLE ES 3

ESTIMATED JOB LOSSES FOR PRODUCTION WORKERS

	PRIMARY POLICY ALTERNATIVES					SECONDARY POLICY ALTERNATIVES	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
	(number of production workers)						
Glass Container Industry	280	280	371	645	462	554	645
Metal Container Industry	613	613	460	Ø	307	153	Ø
Total Job Losses by Production Workers	893	893	831	645	769	707	645

III

BACKGROUND

Just over a decade ago, almost all sales of carbonated soft drinks in Ontario were in refillable bottles. According to recent estimates, which were applicable before the impact of the Government's program was started, only 40% of the total gallonage sales of carbonated soft drinks was in refillable bottles, 40% was in cans and 20% in throwaway glass bottles. In the single-drink size, the pre-policy market share was: refillable bottles 16%, cans 80%, and throwaway glass bottles 4%. Gallonage sales in the single-drink size is about 50% of the total gallonage sales.

A. Ontario Container Trend in Total Gallonage Sales

When total gallonage sales are taken, the market share for each of the three container types for Ontario from 1966 to 1975 is shown in Chart El. Gallonage sales in cans were estimated at 15% in 1966 and continuously rose to almost 45% in 1975. Gallonage sales of throwaway glass bottles rose from a negligible market share in 1966 to the 20% level by about 1972. The sharp decline in the market share in refillable bottles occurred to about 1974. The chart indicates that during 1975 this market decline was arrested and a small reversal is noticeable, i.e., the total market share for refillables rose very slightly, an experience which can be related directly to government policy pressures.

The extension of each container series beyond 1975 in Chart El, the last year comprehensive container sales data were available for Ontario, indicates in a linear manner, the movement towards a market in which the throwaway bottle would disappear, the

CARBONATED SOFT DRINK INDUSTRY  
GALLONAGE SALES BY CONTAINER TYPES FOR ONTARIO  
1966 TO 1975 WITH POLICY PROJECTION TO 1980

GALLONAGE SHARE  
(PERCENTAGE)

100

90

80

70

60

50

40

30

20

10

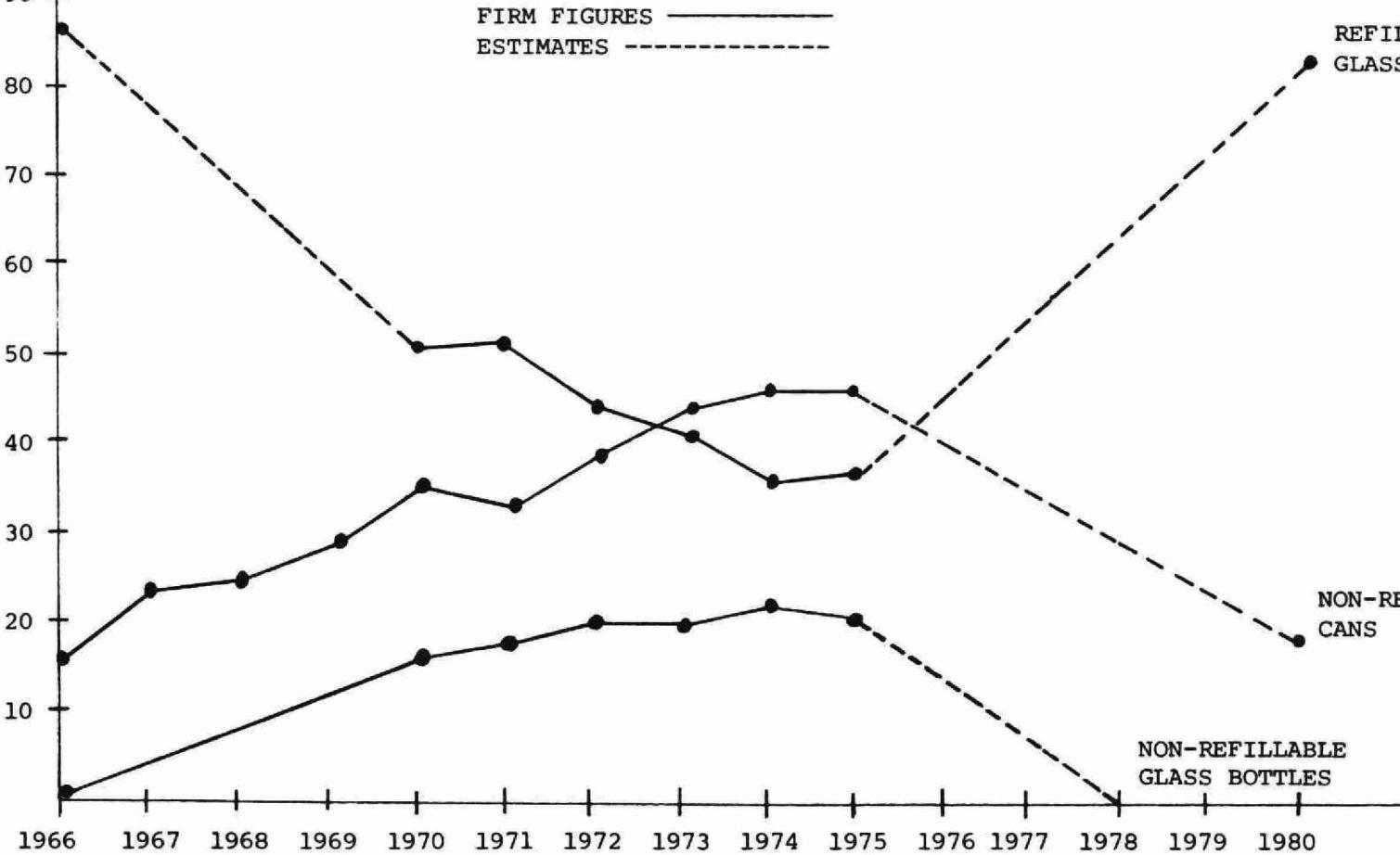
0

FIRM FIGURES —————  
ESTIMATES - - -

REFILLABLE  
GLASS BOTTLES

NON-REFILLABLE  
CANS

NON-REFILLABLE  
GLASS BOTTLES



Source: Statistics Canada and Secretariat Working Papers.

can share would fall to 20% and the refillable bottle would regain market share to an 80% level of total gallonage sales. This is the predicted final impact of the government's policy package when all adjustments have been accommodated.

B. Ontario Container Trend for the Single-Drink Size

The container share for the single-drink size (300 ml. and under) is particularly important when the beverage container problem is analyzed. In the single-drink size, the container competition is primarily between the can and the refillable bottle.<sup>1</sup> About fifty per cent of total gallonage sales in Ontario is sold in the single-drink size. The trends shown in Chart E2 show the very rapid loss in market share for refillables and the concomitant very rapid rise for cans from 1966 to 1975.

There is no evidence in these trends that the single-drink refillable is about to regain market share.

The chart also shows that throwaway bottles have not successfully gained market share against cans in the single-drink size.

The extension in the series from 1975 to 1980 in Chart E2 indicates, again in a linear manner, the estimated market share after the completion of the government's program by 1980. Under this assumption, cans would still be widely available but the single-drink refillable would strongly regain market share.

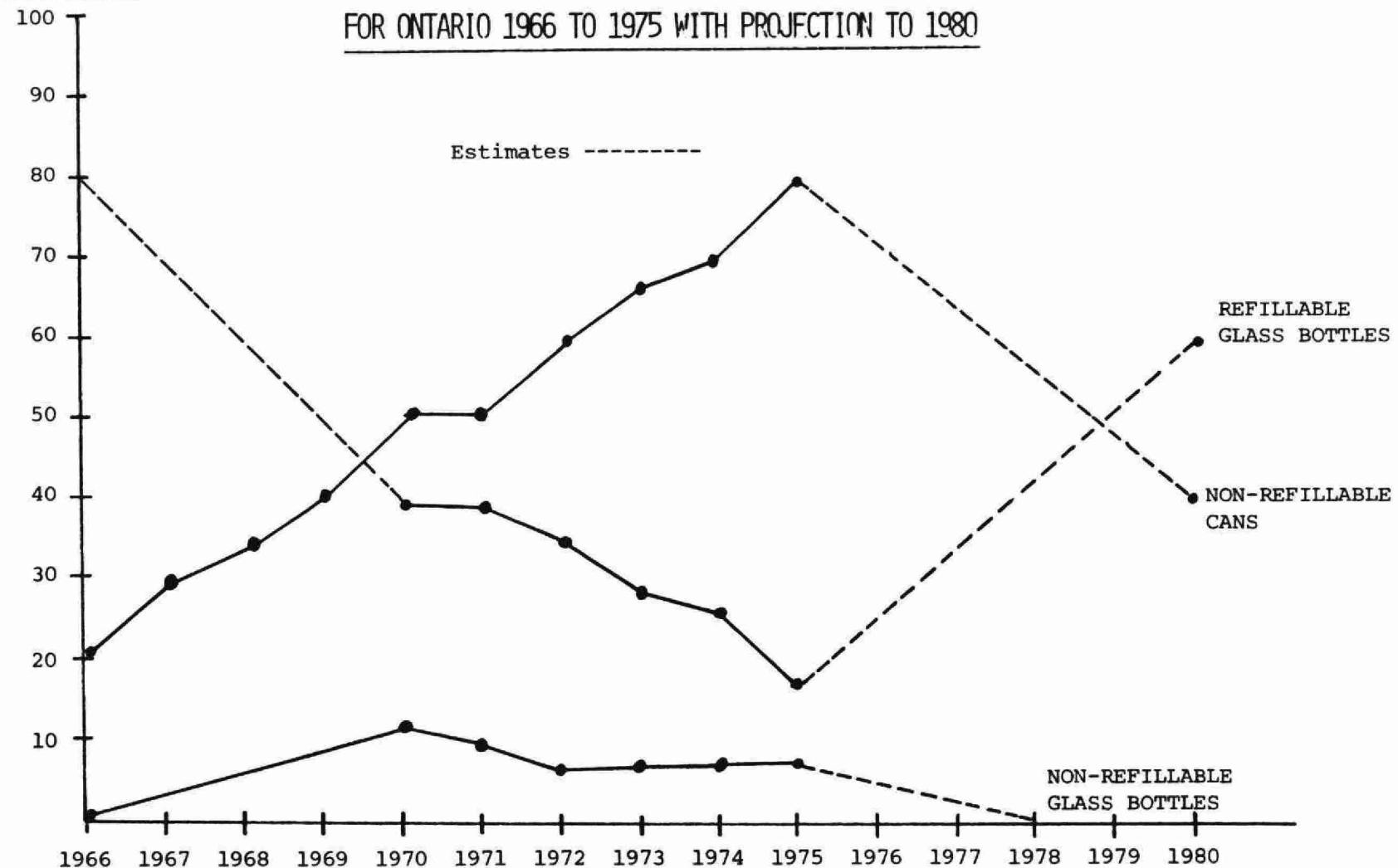
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<sup>1</sup> This is valid except for the on-premise licensed trade in which the competition is between throwaway and refillable bottles.

CARBONATED SOFT DRINK INDUSTRY  
 GALLONAGE SALES BY CONTAINER TYPES  
 FOR SINGLE-DRINK CONTAINER SIZES

GALLONAGE SHARE  
 (PERCENTAGE)

FOR ONTARIO 1966 TO 1975 WITH PROJECTION TO 1980



Source: Statistics Canada and Secretariat Working Papers.

C. Ontario Industry Trends in the Bottling Industry

During these strong container shifts from refillable bottles to throwaway bottles and cans, a substantial level of investment has been required in the two container industries to support the growth in the production of throwaway containers. Over 1,200 new production-worker jobs were created in the two container manufacturing industries associated with throwaway containers.<sup>1</sup>

However, in the Ontario carbonated soft drink industry, there has been a concomitant contraction of investment and unemployment has occurred as some bottlers withdrew from the industry and other soft drink plants shifted from a bottling to a distribution function.

The number of bottling establishments decreased significantly from 135 in 1968 to 85 in 1975. Although gallonage sales increased by about 20% from 1968 to 1974 employment by bottlers decreased from about 5,200 in 1968 to 4,876 in 1974, a loss of 324 jobs. These trends are shown in index form in Chart E3.

One explanation for the regional establishments which went out of business in this period, with a correspondingly sizeable job loss, was the fact that the can filling and distribution system is a totally different operation than the filling and distribution operations for refillable bottles. Most cans are filled in a small number of plants in the Toronto region and centrally warehoused across the province. In some instances, cans are sold in a region without the local bottler being involved. In other instances, the regional bottler acts as a distribution centre.

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<sup>1</sup> It is these 1,200 jobs (about half in each container industry) which are in jeopardy under the beverage container legislation in Ontario.

## CARBONATED SOFT DRINK INDUSTRY

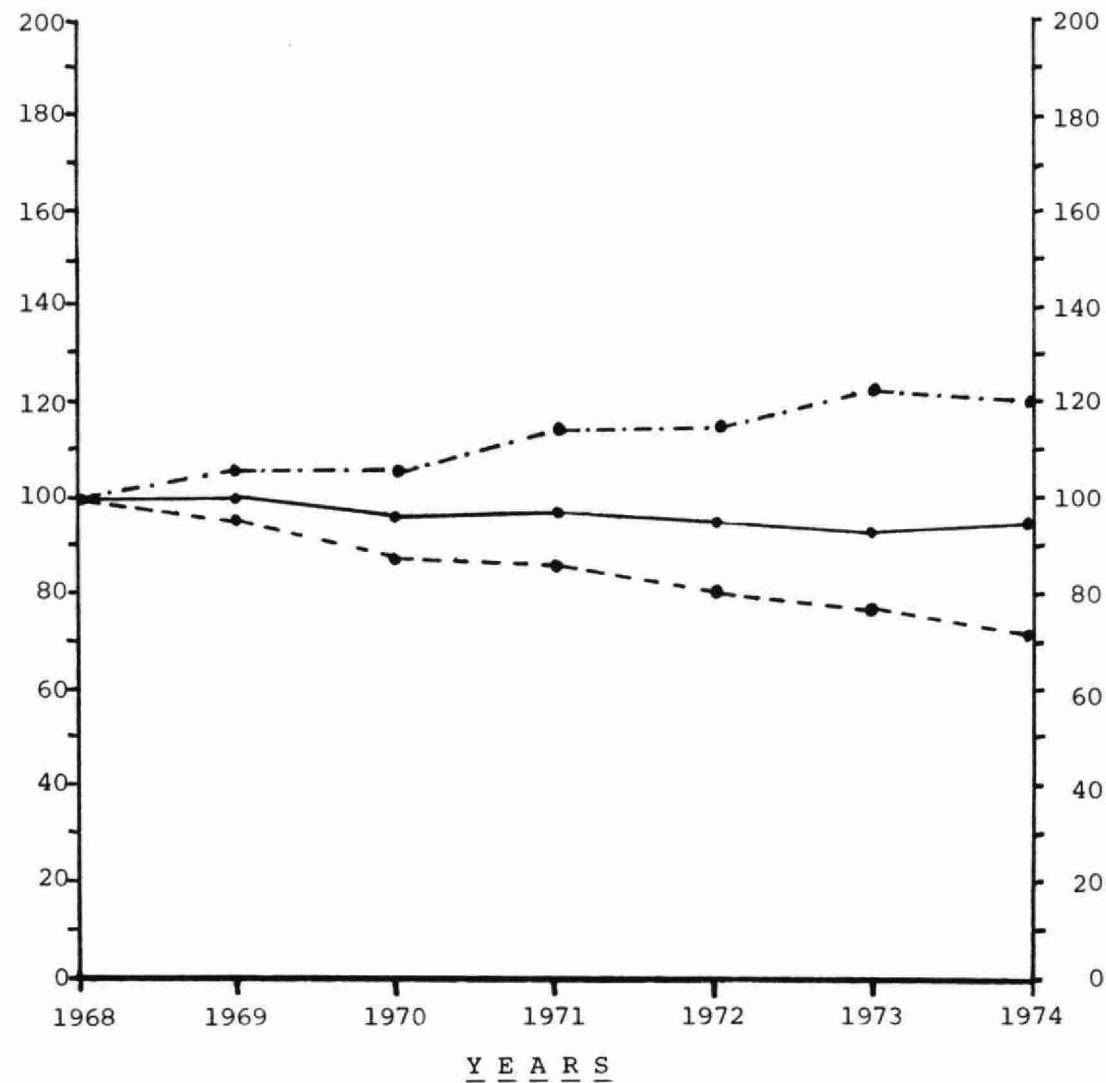
CHART E3

TOTAL GALLONAGE SALES, TOTAL BOTTLER EMPLOYMENT AND

THE NUMBER OF BOTTLING ESTABLISHMENT FOR ONTARIO

1968-1975

INDEX (1968 = 100)

(Gallonage Sales,  
Employment and  
Number of Bottling  
Establishments)
 Gallonage Sales - - -  
 Employment - - -  
 Establishment - - -


SOURCE: Statistics Canada

As has occurred in many industries, the average size of the remaining bottlers has increased (i.e., the average number of employees per establishment has increased from 38 in 1968 to 50 in 1974).

D. Summary

The container shifts in the last decade have shown that throwaway carbonated soft drink containers have dramatically increased their market share, particularly for cans in the single-drink market. As these shifts were occurring, fifty Ontario bottling plants went out of business, and even with a twenty per cent growth in gallonage sales, over 300 jobs were lost in the Ontario bottling industry.

During this decade-long private sector transformation, there were sizeable employment and investment gains in the two container manufacturing industries associated with the dramatic advance of the two throwaway containers. In excess of 1,200 production-worker jobs were created for the manufacture of throwaway carbonated soft drink bottles and cans in Ontario.

IV

GOVERNMENT POLICY GOALS

The Ontario Government's policy goals for carbonated soft drink packaging relate to environmental gains consistent with mitigated economic hardships.

A. Environmental Objective Function

The Ontario Government's environmental goals for the beverage packaging issue are to reduce the volume of solid waste and the litter and to conserve non-renewable raw materials and energy associated with carbonated soft drink packaging. It has been demonstrated that these environmental goals can be best attained when container substitutions are made from non-refillable bottles and from cans to refillable bottles when reasonable trippage levels are experienced. Market share increases in refillable bottles are to be made in both family sizes and single-drink sizes. The single-drink refillable is to regain a significant market share.

B. Economic Objective Function

Concomitantly, the Government wishes to attain these environmental goals without causing undue economic hardships. The prerequisite container shifts from each type of non-refillable will cause direct labour displacements in the two container manufacturing industries. These workers are highly skilled and are employed in a small number of plants in Ontario. It is a government goal that the rate of unemployment in these two container industries be phased over a reasonable gestation period in order that market growth in container sales and company attrition will mitigate the timing and the number of real job losses.

With the unwarranted present high unemployment rate in Ontario, job creation schemes would also be welcomed.

When container substitution from non-refillable cans and bottles to refillable bottles occurs, most policy alternatives predict net job creation will occur when all effects have been evaluated.

It is a fact, however, that the nature of the new jobs created will be vastly different in skill and in space than the production-worker job losses in the two container industries.

#### DEFINITION OF POLICY ALTERNATIVES

Before the government adopted its policy package programme, a number of alternative policy programmes were evaluated on both an environmental and an economic basis. In this report the estimated total sector employment adjustments for seven government policy alternatives for the regulation of the sale of carbonated soft drinks in non-refillable containers are presented. Of these seven policy alternatives, five have been deemed to be primary policy alternatives as they were the ones that illustrated the impacts of the principal policy alternatives that were under active consideration at the time the government's programme was determined.

These policy alternatives are described in some detail in Schedule E1 which includes the programme code. It is perceived that three of these programmes (BAN (PH), POL PACK and IND PROG) would, by design, be carried out over more than a single year.

##### A. Market Share Impact of Programme Alternatives

For each of the seven policy alternatives it is assumed that the policy would cause all sales of carbonated soft drinks in non-refillable bottles to be withdrawn in the first year and to be replaced by refillable bottles. Primarily, this affects sales in family sizes and the on-premise licensed trade in the split size. The impact of this assumption is that gallonage sales in refillable bottles would increase from 40% to 60% (i.e., sales in throwaway bottles before the impact of government action were 20% of total gallonage sales) in the first year for each policy alternative<sup>1</sup>.

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<sup>1</sup>In these percentages no consideration as yet, has been given to the 40% market share for cans.

DEFINITION OF ONTARIO POLICY ALTERNATIVES\*

Schedule E1

		NUMBER OF YEARS FOR PROGRAM COMPLETION	PERCENTAGE REDUCTION IN CAN SALES	
			FIRST YEAR	COMPLETED PROGRAM
<b>A. PRIMARY POLICY ALTERNATIVES</b>				
1. BAN:	An immediate ban (within one year) on the sale of carbonated soft drinks in cans.	one	100%	100%
2. BAN(PH):	A phased ban (over five years) on the sale of carbonated soft drinks sold in cans whereby there would be a 20% reduction in can sales each year.	five	20%	100%
3. MAND(RET):	A five-cent mandatory deposit on carbonated soft drink sales in cans with consumers returning empty cans to retail outlets (e.g., the Oregon and Vermont programs).	one	75%	75%
4. MAND(DEP):	A five-cent mandatory deposit on carbonated soft drink sales in cans with consumers returning empty cans to newly created universal depots (e.g., the Alberta program).	one	0	0
5. POL PACK:	The government's policy package which includes a five-cent tax on carbonated soft drink sales in cans (It is assumed that 50% of the impact occurs in the first year and 25% in the two following years.)	three	25%	50%
<b>B. SECONDARY POLICY ALTERNATIVES</b>				
6. IND PROG:	The bottlers' program which establishes a goal of 70% for sales of carbonated soft drinks in refillable bottles (i.e., a 25% shift from cans to family sized refillables in addition to the withdrawal of throwaway bottles occurs in the second year).	two	0	25%
7. TWO CENTAX:	The government's policy package with a two-cent (instead of five) tax on carbonated soft drink sales in cans. (This assumes no loss in can sales.)	one	0	0

\* It is assumed for each policy alternative that throwaway bottles are replaced by refillables.

Before employment changes can be estimated it is necessary to know the predicted impact on final gallonage sales by container type i.e., between cans and refillable bottles for each policy alternative.

Chart E4 indicates the estimated market share for cans and refillable bottles for the first year of each policy alternative. NO POL indicates the container market share before any government action.

For the three policy alternatives, in which the programme extends beyond one year, the final estimated market share for total gallonage sales when each programme is completed becomes:

	<u>Refillables</u>	<u>Cans</u>
BAN (PH)	100%	0%
POL PACK	80%	20%
IND PROG	70%	30%

Schedule E1 indicates the expected percentage reduction in market share for cans during the first year and after the completed programme transformation period.

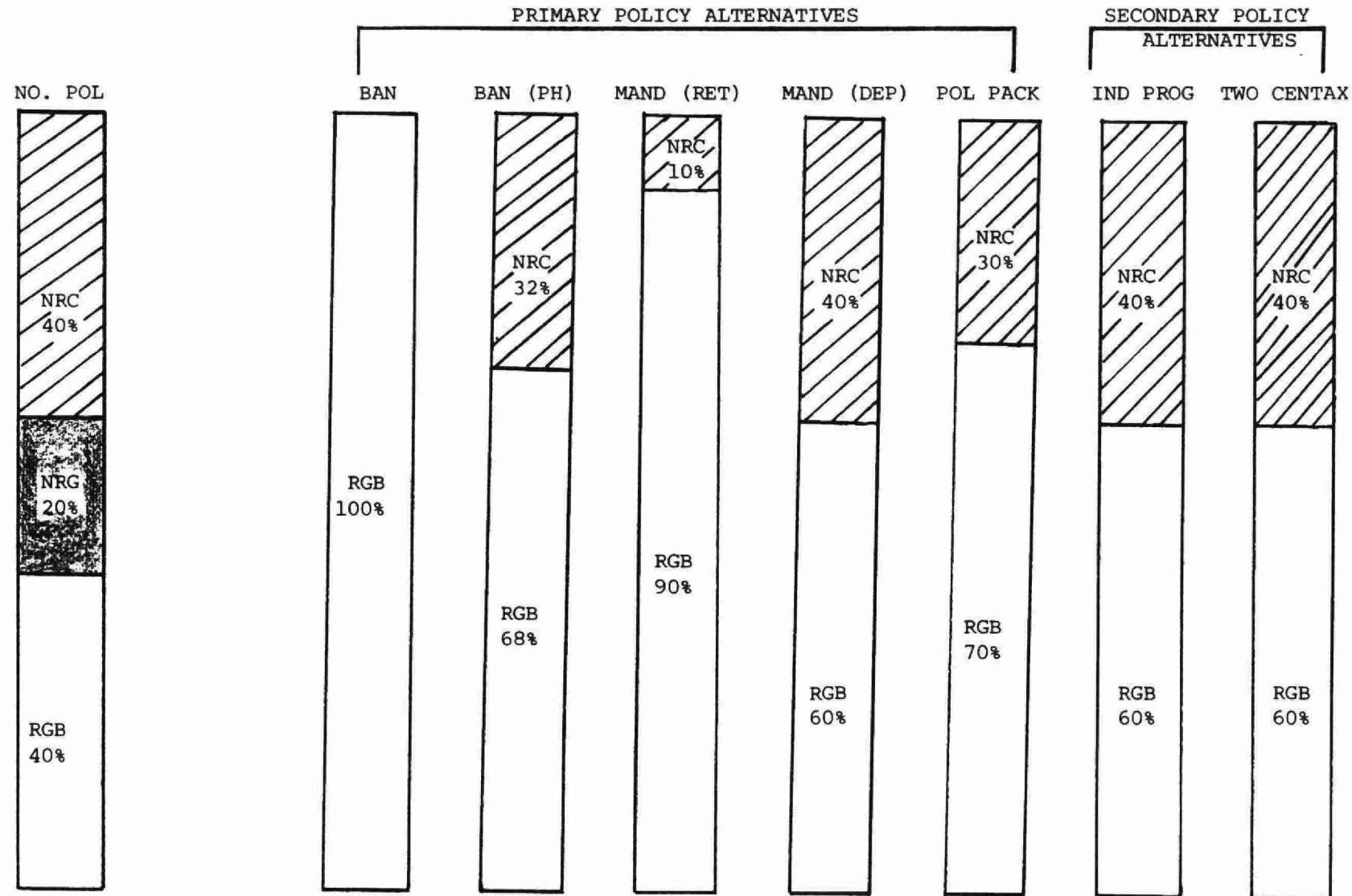
B. Elements of Government's POL PACK

The principal elements of the government's policy package for carbonated soft drink packaging are: mandatory availability of refillable bottles in retail outlets by flavour and by size (effective April 1, 1977); a ban on non-refillable bottles (to be effective April 1, 1978); a 5-cent can tax (on the Order Paper); a ban on detachable easy opening devices for cans (effective July 1, 1977), and the development of three sizes of standard interchangeable refillable bottles for voluntary use.<sup>1</sup>

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<sup>1</sup> Regulations to effect the designation of the standard (in three sizes) are not possible until the specifications for the standard have been determined.

CARBONATED SOFT DRINK INDUSTRY  
ESTIMATES OF ONTARIO GALLONAGE SHARE  
OF CARBONATED SOFT DRINKS BY CONTAINER TYPE FOR POLICY ALTERNATIVES  
(PERCENTAGE SHARE - ONE YEAR LATER)



With the designed phasing elements of this integrated programme, it is assumed that fifty per cent of the substitution from cans to refillable bottles will occur in the first year and twenty-five per cent will be effected in each of the second and the third (and final) years of the program

One of the important aspects of POL PACK is the intention to significantly increase the sales of carbonated soft drinks in single drink refillable bottles i.e., the can share is to fall by fifty per cent when the programme has been completed.

The two opposition parties have to date strenuously opposed the government's five cent can tax. However, it is still the government's desire to include this element which integrates with the mandatory availability requirement to shift container sales from cans to refillables. The mandatory availability requirement, which is unique in Ontario, is needed as a complementary element to ensure that consumers do have a ready choice between cans and refillables. The intention of the five cent can tax, in combination with mandatory availability, is not primarily to raise tax revenue. The greater the degree of container shift, the more successful the can tax and the lower the level of tax revenue it would yield.

VI

OUTLINE OF EMPLOYMENT MODEL

A. Direct and Indirect Employment Effects

Employment changes from the baseline reference point (estimated Ontario gallonage sales and container market share for 1976) were calculated for the direct employment impact by use of productivity analysis (i.e., number of containers produced or handled per man year).

The direct employment effects are defined as those which occur in the container manufacturing plants in Ontario and in the distribution sector by bottlers and retailers who are involved in the handling of the sales and returns of a larger volume of refillable bottles. Both container manufacturing industries provided production worker loss forecasts for the ban-on-throwaway scenario and these have been used unaudited in this study.

Unemployment forecasts in the glass container industry depend upon the market share gained by refillables in the single-drink size and by the once-only increase in refillable bottle float when container conversion to a more refillable system occurs.

The indirect employment effects relate to the possibility of additional job losses in the container support industries (e.g., the steel industry); to the job creation derived from real increases in consumer disposable income associated with increased purchases of carbonated soft drinks in refillable bottles and, in the case of the government's policy programme (POL PACK), the net job creation associated with the expenditure of tax revenue .

The indirect job estimates are less certain than the direct job estimates. The job consequences for an on-line production worker in either container industry can be estimated with more certainty. These container production workers are engaged in plants which exclusively produce either glass bottles or metal cans for soft drinks and other food products.

When the carbonated soft drink container output in these plants (which is a major component of total plant output), is significantly reduced, some job dislocation is certain.

Workers in support industries, (who are part of the indirect employment effect), however, are engaged in plants where they produce a relatively small proportion of total output, and therefore the probability of their continued employment through attrition and growth would be much higher.

B. Comments on Interpretation of Employment Changes

The estimates used in this study represent job losses or gains in man-years. Man-year losses do not necessarily reflect employee losses since corporate growth and plant attrition will allow some production workers to be retained in new assignments in the same plant. Sufficient information on growth and attrition rates was not available and therefore it was not possible to incorporate these desirable adjustments in this report.

When man-years in different industries and for different jobs are aggregated significant differences are disguised. The most important differences in this study relate to the wage-skill characteristics of the container industry production workers and for the employees required in the distribution system. The production worker category represents relatively highly skilled employees who earn incomes well in excess of the Ontario industrial average.

In contrast, the distribution system will require relatively low-skilled jobs where average pay rates are usually below the industrial average. Therefore, if a weighted average were taken of man-hours in these two industrial categories, with average annual compensation rates for each group used to establish the weighting system, one-man year for production workers would be the equivalent of more than one man-year in the distribution system. Accurate data on average annual compensation levels for different groups of workers was also not available. Therefore, it was not possible to adequately develop an equivalent man-year series on employment impacts. One additional difference exists between these two groups of workers. Job losses in the container industries would be highly concentrated in three or four urban regions where the container manufacturing plants exist. The job increases in the soft drink and distribution sectors would be dispersed in most major communities across the province.

When alternative methods for estimating employment changes exist in the study, a conservative approach has been adopted. For instance an alternative method to compute the increase in distribution employment for POL PACK, which was not used for the principal tables in this study, indicated an additional two hundred employees would be required.<sup>1</sup>

C. The Reference Base

Employment changes are computed from the 1976 Ontario level of gallonage sales (estimated at 121 million containerized gallons) and container share which is estimated as follows: 40% of total gallonage in refillables; 40% in cans and 20% in non-refillable bottles. Based on this aggregate, container sales are estimated at: 155 million single drink and 230 million family sized refillable bottles; 80 million single drink and 115 million family sized throwaway bottles and 800

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<sup>1</sup> See Section VIII of this report.

million cans. The family sized sales are measured in 26 oz. equivalents.

When the employment changes associated with each of the seven policy alternatives are computed, it has been assumed that no employment changes had already occurred through government policy action. In this way, the employment changes associated with each of the seven policy alternatives, are taken from a common starting point and are therefore comparable. The statistical characteristics for this reference base are presented in the previous paragraph.

By August 1977, most of the elements in the government's policy package were in actual operation. The five cent tax on cans stands on the Order Paper opposed at this time by both Opposition Parties, and the regulation banning throwaway bottles does not take legal effect until April 1, 1978. The mandatory availability requirement for flavours and sizes became law on April 1, 1977.

As a result of actual government policy some significant shifts in container sales have already occurred i.e., the market share for throwaway bottles has been declining well in advance of the 1978 ban; concomitantly market share of family sized refillables has increased and, with the advent of the mandatory availability requirement, market share for single drink refillables has also increased.

As a result of this container substitution some of the job dislocations (and for the glass container industry the major portion)<sup>1</sup> and some of the new job opportunities have already occurred. These employment adjustments have not been reflected in the tables in this report.

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<sup>1</sup> The Glass Container Council advised the Secretariat late in 1976 that approximately four hundred employees had been laid off in their industry because of government policy.

D. Policy Alternatives and Changes in Employment

The estimated employment changes are made in reference to the design of and the container-mix achievement level identified for each policy alternative. The extent of container shifts and the time pattern for these shifts have been identified in the previous section in which the impact for each policy package was defined.

The direct and indirect employment changes are estimated for the first year for each policy alternative.

Since there is concern over the level of job losses by container production workers, the total job losses have been estimated for these production workers over the entire program adjustment period. One final perspective has been included. The phased ban (BAN (PH)), requires by definition a five-year transformation period. The final table presents the year-to-year changes in direct employment and the cumulative total of job losses in man-years for each program alternative over a five-year period.

Under each of the seven policy alternatives it has been assumed that throwaway bottles would be withdrawn during the first year impact of the programme irrespective of whether the remainder of the programme (i.e., the impact on the market share of cans) is to be completed in one year, or is to be phased over two or more years. The throwaway bottle share of 20% is considered transferred to refillable bottles as part of the first year impact and therefore the refillable bottle share as a result is increased from 40% to 60% without any consideration of possible container substitution from cans to refillable bottles.

The critical assumption for each policy alternative then is what happens to the can share and at what pace does container substitution from cans to single-drink refilables occur.

It is also assumed that consumers return 90% of their empty refillables (i.e., the average propensity to return refillables is 0.9) for each policy alternative and, for the two mandatory deposit systems, consumers return 80% of their can purchases for deposit refund. The employment impact of utilizing different trippage levels is examined for the government's policy package (POL PACK) in section VIII of this report.

VII

ESTIMATED JOB CHANGES UNDER EACH POLICY ALTERNATIVE

The direct and indirect employment effects are identified in the following four tables for each policy alternative. Because of the particular concern over job losses in the two container industries, the last two of these tables isolate the job dislocation impacts for production workers over the programme transformation period.

A. Direct Job Impacts in the First Year of the Programme  
(Table E1)

Table E1 indicates the number of production worker job losses in the two container industries and, concomitantly, the number of job increases in the distribution sector during the first year for each policy alternative.

For production workers in the glass container industry, jobs will be lost because of the withdrawal of throwaway bottles in all sizes. However, new jobs in this industry will be created because of container substitution from both throwaway bottles and cans (when required by the policy alternative) to refillable bottles. This latter impact occurs in two stages: a once-only labour requirement to generate the increased float of refillable bottles, and thereafter a continuing production of replacement refillable bottles which depends upon the level of trippage experienced. The greater the increase in container mix to refillables and the lower the consumer rate of return (i.e., the lower the trippage level) the greater the number of new jobs available in the glass container industry. The latter appears as an offset to the jobs lost, because of the total withdrawal of the production of throwaway bottles.

In the case of the jobs for production workers in the metal container industry, the job dislocation has been estimated on a linear basis and is exclusively a function of the degree of container substitution from cans to single-drink refillables and the number of

metal container workers who would be unemployed under a ban on cans according to industry information.<sup>1</sup>

Each policy alternative requires container substitution from throwaway bottles to refillables, and four policy alternatives require at least some substitution from cans to refillables during the first-year impact. Refillable bottles require more initial distribution labour than cans and additional labour by retailers and bottlers for the handling of returned empty refillable bottles.

Table E1 indicates that there would be net job creation in the first year for each of the five principal policy alternatives when the direct employment effects are estimated i.e., more jobs would be created in the distribution sector than lost by production workers in the two container industries.<sup>2</sup>

The greatest increases in direct employment occur in the two policy alternatives which would induce extreme container shifts from cans to refillables (BAN and MAND (RET)) and in the policy alternative which establishes a separate return system for cans but which, at the same time, does not reduce the can share of the market (MAND (DEP)).

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<sup>1</sup> It is assumed that the market share in cans will not increase in any policy alternative with the withdrawal of throwaway bottles, although a new study undertaken for the Environmental Protection Agency in the United States does not accept this result. Under a mandatory deposit system (MAND (RET)), this study suggests that the can share in the United States will not fall and could assume a share of the throwaway bottle market i.e., the can share could increase.

<sup>2</sup> It has already been stressed that production workers in the two container industries are relatively high skilled and earn above average annual incomes and that the job characteristics in the distribution industry by bottlers and retailers are relatively low skilled, with significantly lower annual levels of compensation.

ESTIMATED INCREASES (DECREASES) IN DIRECT EMPLOYMENT  
IN THE FIRST YEAR FOR EACH POLICY ALTERNATIVE  
(BASED ON ONTARIO SALES 1976, ASSUMING 10 TRIPS)  
(MAN YEARS)

TABLE E1

	<u>PRIMARY POLICY ALTERNATIVES</u>					<u>SECONDARY POLICY ALTERNATIVES</u>	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
I. Distribution System (Bottlers and Retailers)	2095	733	1881	2922	819	393	393
II. <u>Container Manufacturing</u> (Production Workers)							
i) Glass	13	(492)	(144)	(618)	(461)	(618)	(618)
ii) Metal	(613)	—	(460)	Ø	(153)	Ø	Ø
SUB TOTAL	(600)	(615)	(604)	(618)	(614)	(618)	(618)
III. TOTAL	1495	118	1277	2304	205	(225)	(225)
	—	—	—	—	—	—	—
IV. Rank in Order of Total Employment Increases	(2)	(5)	(3)	(1)	(4)	(6)	(6)

NOTE: DECREASES IN EMPLOYMENT ARE EXPRESSED IN BRACKETS

SOURCE: Secretariat Working Papers and Appendices

The remarkable consistency in the total number of production worker job losses when both container industries are considered for all seven policy alternatives arises because of an unusual circumstance.

The production worker job losses of 613 in the metal container industry under a ban on cans (under BAN) would be almost identical to the production worker job losses in the glass container industry of 618 if there were no container substitution from cans to refillables (e.g., under MAND (DEP)).

Therefore, whatever the market shift between cans and single-drink refillables, just over six hundred production worker job losses in total are expected. The division of these job losses between the two container industries is, however, a direct function of the degree of the container shift between cans and single drink refillables i.e., the greater the shift the greater the job loss in the metal container industry.

The reduction in direct employment in the first year for the two secondary policy alternatives (IND PROG and TWO CENTAX) arises primarily because the only container shift is from throwaway bottles to refillables (i.e., the market share for cans is unchanged). Maximum job losses occur in the glass container industry but there are not large compensatory increases in the distribution sector, i.e., the only increase in the use of refillable bottles is derived from the withdrawal of non-refillable bottles.

B. Direct and Indirect Employment Impacts in the First Year of the Programme (Table E2)

Table E2 indicates the total employment effect when the direct employment impact (Table E1) is integrated with the indirect labour impact for the first year for each policy alternative.<sup>1</sup>

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<sup>1</sup> It is assumed that all employment effects occur at establishments in Ontario.

ESTIMATED INCREASES (DECREASES) IN TOTAL EMPLOYMENT  
IN THE FIRST YEAR FOR EACH POLICY ALTERNATIVE  
(BASED ON ONTARIO SALES, 1976, ASSUMING TEN TRIPS)  
(MAN YEARS)

TABLE E2

	<u>PRIMARY POLICY ALTERNATIVES</u>					<u>SECONDARY POLICY ALTERNATIVES</u>	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
<u>I. DIRECT EMPLOYMENT EFFECTS</u>							
a) Distribution System (Bottlers and Retailers)	2095	733	1881	2922	819	393	393
b) Container Manufacturing (Production Workers)							
Glass	13	(492)	(144)	(618)	(461)	(618)	(618)
Metal	(613)	(123)	(460)	Ø	(153)	Ø	Ø
SUB TOTAL	(600)	(615)	(604)	(618)	(614)	(618)	(618)
c) Direct Employment Increases (Decreases)	<u>1495</u>	<u>118</u>	<u>1277</u>	<u>2304</u>	<u>205</u>	<u>(225)</u>	<u>(225)</u>
<u>II. INDIRECT EMPLOYMENT EFFECTS</u>							
a) Consumer Sector	621	321	441	(1529)	341	248	248
b) Tax Revenue Outlay	n/a	n/a	n/a	n/a	325	n/a	33
c) Support Workers for Container Mfg.	(695)	(330)	(581)	(239)	(353)	(239)	(239)
d) Indirect Employment Increases (Decreases)	<u>(74)</u>	<u>(9)</u>	<u>(140)</u>	<u>(1768)</u>	<u>313</u>	<u>9</u>	<u>42</u>
<u>III. TOTAL EMPLOYMENT INCREASES (DECREASES)</u>							
	<u>1421</u>	<u>109</u>	<u>1137</u>	<u>536</u>	<u>518</u>	<u>(216)</u>	<u>(183)</u>
<u>IV. RANK IN ORDER OF TOTAL EMPLOYMENT INCREASES</u>							
	(1)	(5)	(2)	(3)	(4)	(7)	(6)

SOURCE: Secretariat Working Papers and Appendices

The indirect labour impacts are second order effects during the container substitution process and are therefore less certain than the direct effects. For this reason, the indirect employment effects, which carry a greater margin of error, should be of less significance when evaluating each policy alternative than the direct employment impacts.

The indirect employment effects are isolated into three categories:

- (a) indirect job losses in the container support industries (e.g., steel) which exist at a higher rate for the metal container industry than for the glass container industry.
- (b) indirect job increases related to fifty per cent of the estimated real increase in consumer disposable income which is derived when there is an increase in market share for refillable bottles (i.e., carbonated soft drinks are cheaper in refillable bottles).
- (c) indirect job increases (on a net basis) when the tax revenue expenditure impact of the government is evaluated for proposals POL PACK and TWO CENTAX.

When the first year employment impact for the primary policy alternatives are reviewed the two most job creative policy options are again the two which require exceptional and rapid shifts from cans to single-drink refillable bottles (BAN and MAND (RET)).

The mandatory deposit system, with can returns to universal depots (which requires no reduction in the market share for cans), produces a very large indirect job loss in the consumer sector. The Alberta experience is that consumers must pay a significantly higher price for cans to support the separate depot-return system.

As a result consumers receive few benefits from the shift of throwaway bottles to refillable bottles and bear a substantial loss in disposable income to support the can return system.<sup>1</sup> In the other six policy alternatives, increases are expected in real consumer disposable income.

The employment generation effect associated with the estimated expenditure of tax revenue raises the government's policy package alternative (POL PACK) to a significantly more positive employment position than the phased ban (BAN (PH)). In this calculation, the net tax impact on employment is the result of two divergent forces: job creation through new jobs associated with the expenditure of the tax revenue and the negative job impact derived from the consumer sector, since payment of the can tax would reduce the real level of disposable income for consumers who still purchase cans.<sup>2</sup>

Job losses are predicted in the first year for the two secondary policy alternatives. The number of jobs created in the consumer sector are almost offset by the indirect job losses expected in the glass container support industries. In these two proposals, the net effect of the direct job impact in the first year for each programme was also for a reduction in jobs.

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<sup>1</sup> There would be a significant reduction in beverage containers in litter under the return-to-depot system.

<sup>2</sup> One unusual aspect of this tax is that a consumer can still purchase carbonated soft drinks (in refillable bottles) and not bear the loss in disposable income. This assumes the availability of refillables in retail outlets.

In summary, when the direct and indirect employment impacts are integrated, the five primary policy alternatives generate positive employment effects in the first year.<sup>1</sup>

C. Direct Job Losses for Production Workers Under the Total Programme Impact Period (Table E3)

Table E1 disclosed the number of estimated production worker job losses during the first year impact for each policy alternative. The additional information provided in Table E3 is the number of estimated production worker job losses that would occur for each policy alternative over the complete programme impact period. The table does not estimate job losses in man-years. A job loss <sup>2</sup> in year one or year five is counted exactly once.

The longer the program-impact period the greater the possibility that the employees affected could be reassigned in the container company through the forces of attrition and increased container production from

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<sup>1</sup> This is not unexpected. Government policy proposals are assessed on the following basis: when a dollar of wage income is withdrawn from one sector in Ontario, it is assumed to reappear through a multiplier process in another sector in the province. Since production worker losses represent higher paid jobs than the new jobs to be created in the distribution and other sectors, the a priori conclusion would be that a container shift from throwaway bottles or cans to refillable bottles would be job creative. This rule was not used in the determination of the job changes in this report, but it does afford a general check on the direction of the net employment impact.

<sup>2</sup> The cumulative effect over the five-year period is presented in Table E4.

industrial growth.<sup>1</sup> Therefore, there could be a significant disparity between any number appearing in Table E3 representing job losses and actual employee discharges or lay-offs. The longer the program gestation period, the greater the magnitude of this disparity; the fewer the number of actual lay-offs.

The difference in the results in Tables E1 and E3 can be seen under the number of production worker losses in the metal container industry for the first two programme alternatives. In Table E1 the metal container job losses under BAN and BAN (PH) are 613 and 123 respectively, which represents the first-year effect, whereas in Table E3 the estimates are 613 for each of these policy alternatives.

The intention of the five-year phased ban is exactly to mitigate employment losses in the metal container industry, although total programme job losses are identical under both alternatives which ban the can.

For the glass container industry, some production workers are required to manufacture refillable bottles to establish the once-only float increase. Therefore, although both mandatory deposit scenarios are expected to be completed in one year, the number of production-worker job losses in Table E1 is smaller than that reported in Table E3 because of the short run necessity to produce the increased refillable bottle float.<sup>2</sup>

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<sup>1</sup> Growth could occur for cans in the carbonated soft drink industry, the non-carbonated beverage industry, the tinned fruit industry, etc.

<sup>2</sup> Those involved with the float production will, however, not be required the year after the bottle float increase has been completed.

ESTIMATED DECREASES IN EMPLOYMENT  
FOR PRODUCTION WORKERS IN CONTAINER INDUSTRIES  
FOR EACH POLICY ALTERNATIVE  
UNDER THE TOTAL PROGRAM IMPACT PERIOD

TABLE E3

ESTIMATED JOB LOSSES FOR PRODUCTION WORKERS

	PRIMARY POLICY ALTERNATIVES					SECONDARY POLICY ALTERNATIVES	
	<u>BAN</u>	<u>BAN (PH)</u>	<u>MAND (RET)</u>	<u>MAND (DEP)</u>	<u>POL PACK</u>	<u>IND PROG</u>	<u>TWO CENTAX</u>
(number of production workers)							
Glass Container Industry	280	280	371	645	462	554	645
Metal Container Industry	613	613	460	Ø	307	153	Ø
Total Job Losses by Production Workers	893	893	831	645	769	707	645
	==	==	==	==	==	==	==

Phased adjustment programs also cause differences in job loss forecasts in the glass container industry. It is always assumed in this analysis that the throw-away bottles are withdrawn in the first year for each policy alternative.

Examine the case of the BAN and the production-worker job losses in the glass container industry. In Table El, there is a net increase in employment of 13. An estimated 293 jobs (for one year) are required to establish the very large increase in the refillable bottle float, since under the ban all throwaway containers (bottles and cans) are replaced by refillable bottles. Once this increased float has been established, these jobs associated with the float creation are not required. Thus the need for 293 production worker jobs in year one disappears in year two. The net consequence is a job loss of 280.<sup>1</sup> This 280 estimate of production worker job losses in the glass container industry relates to the elimination of throwaway bottles less the need to replace refillable bottles not returned by consumers in the new increased bottle float.

It should be noted that the total number of job losses under POL PACK is less than under BAN (PH) with both these alternatives requiring a three to five year gestation period. Job losses are greatest under the two ban alternatives and are least under the two policies which do not require any container shift from cans to refillable bottles (e.g., MAND (DEP) and TWO CENTAX).  
In these latter cases, all the job losses are, of course, experienced in the glass container industry.

<sup>1</sup> The + 13 jobs of Table El minus the 293 production worker jobs which were sustained for one year due to the increased bottle float requirements constitute the reduction of 280 jobs.

Under POL PACK there is a division of job losses between the two container industries. It has also been reported that most of the job dislocations expected in the glass container industry, as reflected in Table E3, have already occurred.

D. The Cumulative Impact of Job Losses for Production Workers in Man Years (Table E4)

Table E4 provides the year-to-year production-worker job changes for the two container industries on a consistent basis.

The glass container job losses are divided into production worker changes associated with a different flow of bottle production (increases in the production of refillable bottles to sustain an increased bottle float and the elimination in the first year of the production of throwaway bottles)<sup>1</sup> and, secondly, with the once-only increase in the production of refillable bottles in years in which the refillable bottle float must be increased. When the float adjustment has been completed in each programme, then there will be additional job dislocation in the following year.

Table E4 contains two summary columns which are of interest. The line headed "total-man year lost each year" for each programme ultimately equals the number of production worker losses in Table E3 except for BAN (PH). In this programme, fifty three production workers are still generating additional refillable bottle float in year five. They become unemployed in year six.

This total of 53 becomes the difference between the 840 total (year five in Table E4) and the 893 total (which appears in Table E3).

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<sup>1</sup> Refillable bottles are also heavier than throwaway bottles of the same size.

TABLE E4

- 50 -

ESTIMATED YEAR-TO-YEAR INCREASES (DECREASES) IN DIRECT EMPLOYMENT  
IN THE CONTAINER INDUSTRIES FOR EACH POLICY ALTERNATIVE  
FOR THE FIRST FIVE YEARS OF THE PROGRAM (MAN YEARS)

CONTAINER MANUFACTURING (PRODUCTION WORKERS)	PRIMARY POLICY ALTERNATIVES										SECONDARY POLICY ALTERNATIVES																													
	BAN					BAN (PH)					MAND (RET)					MAND (DEP)					POL PACK					IND PROG					TWO CENTAX									
	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th					
<b>I. GLASS CONTAINER INDUSTRY</b>																																								
Replacement of Float	(280)	0	0	0	0	(572)	73	73	73	73	(371)	0	0	0	0	(645)	0	0	0	0	(554)	46	46	0	0	(645)	91	0	0	0	(645)	0	0	0	0					
Float adjustment	293	(293)	0	0	0	80	(27)	0	0	0	227	(227)	0	0	0	27	(27)	0	0	0	93	(60)	0	(33)	0	27	40	(67)	0	0	27	(27)	0	0	0					
Employment Increase (Decrease)	13	(293)	0	0	0	(492)	46	73	73	73	(144)	(227)	0	0	0	(618)	(27)	0	0	0	(461)	(14)	46	(33)	0	(618)	131	(67)	0	0	(618)	(27)	0	0	0					
<b>II. METAL CONTAINER INDUSTRY</b>																																								
Employment Increase (Decrease)	(613)	0	0	0	0	(123)	(123)	(123)	(122)	(122)	(460)	0	0	0	0	0	0	0	0	0	(153)	(77)	(77)	0	0	0	(153)	0	0	0	0	0	0	0	0	0				
<b>III. TOTAL INCREASE (DECREASE) IN PRODUC- TION WORKER EMPLOYMENT</b>						(615)	(77)	(50)	(49)	(49)	(604)	(227)	0	0	0	(618)	(27)	0	0	0	(614)	(91)	(31)	(33)	0	(618)	(22)	(67)	0	0	(618)	(27)	0	0	0					
<b>SUMMARY</b>						(600)	(293)	0	0	0	(615)	(692)	(742)	(791)	(840)	(604)	(831)	(831)	(831)	(831)	(618)	(645)	(645)	(645)	(645)	(614)	(705)	(736)	(769)	(769)	(618)	(640)	(707)	(707)	(707)	(618)	(645)	(645)	(645)	(645)
<b>TOTAL MAN YEARS LOST EACH YEAR</b>						(600)	(893)	(893)	(893)	(893)	(615)	(692)	(742)	(791)	(840)	(604)	(831)	(831)	(831)	(831)	(618)	(1263)	(1908)	(2553)	(3198)	(614)	(1319)	(2055)	(2824)	(3593)	(618)	(1258)	(1965)	(2672)	(3379)	(618)	(1263)	(1908)	(2553)	(3198)
<b>CUMULATIVE MAN-YEARS LOST</b>						(600)	(1493)	(2386)	(3279)	(4172)	(615)	(1307)	(2049)	(2840)	(3680)	(604)	(1435)	(2266)	(3097)	(3928)	(618)	(1263)	(1908)	(2553)	(3198)	(614)	(1319)	(2055)	(2824)	(3593)	(618)	(1258)	(1965)	(2672)	(3379)	(618)	(1263)	(1908)	(2553)	(3198)
<b>RANK IN ORDER OF LEAST CUMULATIVE MAN-YEARS LOST AFTER THE FIFTH YEAR</b>						(7)		(5)			(6)					(1)					(4)					(3)					(1)									

Finally, the last summary line of Table E4, "cumulative man-years lost", presents another perspective to production worker job losses. The results in Table E4 indicate for each policy alternative the number of production worker job losses in man-years in the two container industries in a cumulative manner. For instance, under BAN, there would be 600 man-years lost after the first year, 1493 after two years and 4172 for the five-year period.

The impact of a phased programme on production-worker job losses is the paramount observation from this table.  
The two policy alternatives which require rapid and extreme shifts from cans to refillables (BAN and MAND (RET)) produce the largest cumulative totals of production worker man-years lost (4172 and 3928 respectively) for the five-year assessment period.

The cumulative total of man-years for the five-year phased ban (3680) exceeds that for POL PACK (3593). This differential arises in these phased programme options because of the greater container shift ultimately required under a phased ban (i.e., the can is eliminated in the market).

When the five-year cumulative totals of production worker job losses in man-years for all seven policy alternatives are considered the best ranking is accorded to MAND (DEP) and TWO CENTAX which have an identical total of 3198. The identical production worker job loss matrix for each of these policy alternatives is not accidental. In each policy alternative the primary impact is completed in the first year (throwaway bottles are replaced by refillables) and neither policy impacts on the market share for cans.

In summary, a phased program which requires a significant container shift from cans to refillable bottles mitigates the cumulative total of man-year production-worker job losses. Under these conditions the government's policy

package (POL PACK) would be ranked highest.

It should be emphasized that the cumulative job loss measurements evaluated in Table E4 refer exclusively to production worker jobs in the two container industries.

The greater the deferred period for container worker job losses, the greater the possibility that the employees affected could be relocated within their companies through the forces of attrition and growth.

VIII

EMPLOYMENT IMPACT FOR THE GOVERNMENT'S  
POLICY PACKAGE UNDER DIFFERENT ASSUMPTIONS

A. Introduction

The total first-year employment impacts for the government policy package (POL PACK) were analyzed in greater depth than for the other policy alternatives. Three independent modifications were made and the derived employment impacts related to each of these modifications are presented in Table E5. The modifications to the basic employment model are:

- 1) adjusting the trippage level to 5 and 20;
- 2) adopting the Folk distribution methodology;
- 3) introducing a retail handling charge of two cents for returned refillable containers  
(cum Folk).

B. The Employment Model and Different Trippage Assumptions  
(Panel A of Table E5)

Trippage represents the average number of times a refillable bottle is delivered with contents for resale. The trippage level primarily depends upon the average propensity of consumers to return refillable bottles for deposit refund (APR).<sup>1</sup> In the employment model, a trippage for refillables of 10 was assumed. This corresponds to a 90% consumer return rate (e.g., an APR of 0.9).

In this section trippage levels of 5 and 20 (which correspond to consumer return rates of 80% and 95%) are injected into the employment model for POL PACK.

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1

There is also a technical breakage factor of about one per cent which usually occurs during the filling operation. This additional leakage is not reflected in these discussions.

When a lower (than 10) trippage level is included, two direct employment elements are affected. First, the glass container industry has to produce more refillable bottles (because of the lower return rate) to sustain the total float of refillable bottles, and therefore more production workers would be needed. However, since consumers would return fewer refillable bottles for deposit refund, there would be a smaller increase in employment in the distribution sector than under the 10-trip scenario.

When a higher trippage level (than the base level of ten) is evaluated, the employment modifications would shift in the opposite directions; there would be fewer production worker jobs in the glass container industry and more new distribution jobs would be required associated with the greater number of consumer returned refillable bottles.

When the trippage level changes, two of the indirect employment impacts are also affected; the consumer sector impact and the support worker impact for the glass container industry.

Consider the consumer sector indirect employment effect. When the trippage level decreases below the reference standard of ten, the amortized cost of the refillable bottle per container sale rises; this impacts unfavourably on the price of carbonated soft drinks in refillable bottles and, therefore, reduces the increase in disposable income for consumers derived for POL PACK.<sup>1</sup>

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<sup>1</sup> The under ten trips resulted in an increase in consumer disposable income, because carbonated soft drinks are cheaper in refillable bottles than in cans and throwaway bottles.

When consumers return a lower rate of refillable bottles for deposit refund, more automatically forego the amount of the deposit refund and this also becomes a significant factor which additionally reduces the disposable income level for consumers.

With a reduced level of disposable income, fewer indirect jobs would be derived associated with a reduced increase in consumer disposable income under POL PACK. If the lower trippage level impact on disposable income were sufficiently large, there could be derived job losses under POL PACK **for the consumer sector impact.**

If the trippage level exceeded ten (e.g. was 20), then the amortized refillable bottle cost would be lower which would result in cheaper consumer prices for refillables.<sup>1</sup> and a lower level of deposit losses. Thus, there would be a higher level of consumer saving under POL PACK (than under the 10-trip scenario) and more indirect jobs would be created.

The support worker employment trippage impact is a direct function of the changes in the number of production workers affected in the glass container industry.<sup>2</sup>

Panel 'A' in Table E5 shows that at five trips the net direct employment impact under POL PACK is higher than at 10 trips, but the overall employment change is less employment positive. For direct employment changes, there are more jobs gained in the glass container industry than lost in the distribution industry.

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<sup>1</sup> Representatives of the Ontario soft drink industry have often made this point.

<sup>2</sup> For every 100 glass production workers affected, it is assumed that there would be an additional 38 support industry workers affected.

ESTIMATED INCREASE (DECREASE) IN TOTAL EMPLOYMENT  
IN THE FIRST YEAR FOR THE POL PACK POLICY ALTERNATIVE  
UNDER DIFFERENT POLICY ASSUMPTIONS (BASED ON ONTARIO SALES, 1976)  
(MAN YEARS)

TABLE E5

	Basic Study Assumptions (10 trips) (APR: 0.90)	PANEL A		PANEL B	PANEL C
		Trippage Variation		Folk Distribution Assumptions	Folk Model Cans Retail Handling Charge
		5 trips (APR: 0.80)	20 trips (APR: 0.95)		
<b>I Direct Employment Effects</b>					
(a) Distribution System (Bottlers and Retailers)	819	705	873	1088	2045
(b) Container Manufacturing (Production Workers)					
GLASS	(461)	(234)	(574)	(461)	(461)
METAL	(153)	(153)	(153)	(153)	(153)
Sub-Total	(614)	(387)	(727)	(614)	(614)
(c) Direct Employment Increases (Decreases)	<u>205</u>	<u>318</u>	<u>146</u>	<u>474</u>	<u>1431</u>
<b>II Indirect Employment Effects</b>					
(a) Consumer Sector	341	(172)	598	341	(244)
(b) Tax Revenue Expenditure	325	325	325	325	325
(c) Support Workers for Container Manufacturers	(353)	(265)	(397)	(353)	(353)
(d) Indirect Employment Increases (Decreases)	<u>313</u>	<u>(112)</u>	<u>526</u>	<u>313</u>	<u>(272)</u>
<b>III Total Employment Increase (Decrease)</b>	<u>518</u>	<u>206</u>	<u>672</u>	<u>787</u>	<u>1159</u>

When the indirect job impacts are evaluated, soft drink prices rise to an extent that there is an expected decrease in consumers' disposable income and, therefore, there are derived job losses for this element. With more production workers in the glass industry, there is a smaller indirect job loss by support workers.<sup>1</sup>

Under the 20-trip scenario (when compared to the 10-trip reference scenario), there would be a reduction in net direct employment increases from 205 to 146. The overall employment consequences are more employment positive than under the reference scenario.

In summary, when the employment impacts for the first year of POL PACK are re-evaluated at five trips and at 20 trips, there are no fundamental differences in the results; in each case net direct employment is positive, and the overall employment impact, when the direct and indirect employment effects are integrated, is also job creating.

#### C. Folk Distribution Methodology

The basic model in this study used a productivity method to estimate the increase in employment in the distribution sector by retailers and soft drink bottlers.<sup>2</sup>

In this section, the Folk cost shift method was utilized as a substitute procedure. It was this method which was utilized in the Solid Waste Task Force Report to determine the employment impact of a ban on throwaway containers in the Ontario carbonated soft drink industry.<sup>3</sup>

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<sup>1</sup> The changes in jobs in this paragraph refer to changes from the employment levels which had already been calculated for POL PACK.

<sup>2</sup> Details are provided in the appendices to this report.

<sup>3</sup> See Solid Waste Task Force Report, Volume II, Chapter II.

The impact of the Folk method in the first year of POL PACK is to increase the number of new employees required in the distribution system from 819 to 1088, which appears in Panel 'B' of Table E5. This substitution is independent of any other element in the employment model and, therefore, the overall employment impact of 787 jobs is also greater by exactly the 269 additional distribution jobs.

The productivity method was adopted in the basic model for this report because it was based on harder data input than available for the Folk technique and because it provided more conservative employment estimates.

D. Employment Effect of a Two-Cent Retail Handling Charge<sup>1</sup>

With the use of the Folk-model technique, it is possible to investigate the impact of a two-cent handling charge imposed by retailers for returned refillable bottles.

If a handling charge were introduced, the Folk method would indicate an additional demand for labour to handle the returned refillables. Concomitantly, prices for carbonated soft drinks in refillables would increase and consumer disposable income would be reduced accordingly.

The results of this extension of the Folk model are shown in Panel 'C' of Table E5. The comparisons are with the Folk model impact in Panel 'B'.

The direct employment increase in the distribution system, when the handling charge is introduced, becomes 957 additional low skilled job opportunities in the retail sector. The distribution sector would require 2,045 jobs instead of the 1,088 indicated by the Folk model in Panel 'B' and the 819 used in the basic study.

<sup>1</sup>

This handling charge would be introduced by retailers and not by government regulation.

With a decrease in disposable income, there would be a decrease of 585 jobs in the consumer sector.

The net effect in the total employment impact would be an increase of 372 jobs from 787 to 1,159 when compared to the Folk model in Panel 'B'.

In summary, the establishment of a retail handling charge of two cents would have a dramatic effect on the jobs created in the distribution sector. These jobs are low skilled compared to production worker job losses.

E. Summary

When the three adjustments to the standard model are examined, the first year employment effects for the government's policy package are job creative. The net direct employment effect was positive for each modification. When the Folk technique was introduced (either with or without a handling charge), there was a significantly large increase in the number of new jobs required in the distribution sector. This resulted in a dramatic increase (over the reference model) in net direct employment, although most of the new jobs would require low job skills.

BEVERAGE CONTAINER EMPLOYMENT STUDIESIN OTHER JURISDICTIONS

In recent years, several studies in the United States have investigated the impact on employment under a mandatory deposit system in the carbonated soft drink industry with consumer returns of throwaway containers to retail stores (i.e., MAND (RET)).

A. Folk Study on Illinois

The first study on the employment effects associated with a mandatory deposit system for non-refillable containers was undertaken by Folk for Illinois in 1972.<sup>1</sup>

Folk's assumptions on the degree of shifts in the container mix were somewhat different than assumed in the present study; non-refillable bottles would decrease in market share by merely 20% and cans 36% whereas refillable bottles would gain only 10%. Also, higher trippage rates of 12 and 16 were used for single drink and family size refillable containers respectively.

From his investigation, he concluded that if a MAND (RET) policy were enacted for Illinois, there would be an employment gain of approximately 6,600 jobs.

B. Oregon and Vermont

The two States in which the mandatory deposit system is currently in practice, Oregon<sup>2</sup> and Vermont,<sup>3</sup> both have carried out investigations on the employment impacts associated with their beverage container legislation.

<sup>1</sup> Folk, Hugh, Employment Effects of the Mandatory Deposit Regulations - State of Illinois Institute for Environmental Quality, Springfield, Ill., Nov. 1972

<sup>2</sup> State of Oregon, Dept. of Environmental Quality - Oregon's Bottle Bill: The 1977 Report, Portland, Oregon, 1977, p.6

<sup>3</sup> Nadworny, Milton, J., Some Economic Consequences of the Vermont Beverage Container Deposit Law, Univ. of Vermont, Feb. 1975

The results of these studies, in States in which there was no (or a very small level of) container manufacturing employment, indicated that their beverage container legislation was employment creative.

C. Research Triangle Institute Study

The most recent and comprehensive review of the employment effects from a mandatory deposit system was undertaken by the Research Triangle Institute for the U.S. E.P.A.<sup>1</sup>

The study introduced two scenarios related to the market-share impact for containers and the associated consumer return rate for refillable bottles and for non-refillable cans for the beer and the carbonated soft drink industry across the United States.

The employment impact was a function of the change in the container mix; the consumer return rates for refillable bottles and cans, and the five-year phasing period allowed to 1982.

The first scenario assumed that can sales in the carbonated soft drink industry would hold at their 1976 national level (i.e., which would mean by 1982 a small decline in can share); refillable bottles and cans are returned at 90%.

The second and more severe scenario assumed that can sales would fall to fifty per cent of their 1976 national level and consumer return rates for refillables and cans would only be 80%.

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<sup>1</sup> Research Triangle Institute, Energy and Economic Impacts of Mandatory Deposits, Federal Energy Administration, Office of Energy Conservation and Environment, Washington, D.C., September 1976.

Both scenarios assume the withdrawal of throwaway bottles and that refillable bottles and cans would be returned to retail stores for deposit refund.

The employment segment of the study included changes in direct employment only; it did not evaluate the derived consumer sector employment impact.

When the employment impacts for the carbonated soft drink sector are isolated, both scenarios forecast a strong increase in direct employment. In fact, in each scenario, although the total changes were different, the direct employment impact indicated that four new jobs would be required in the distribution sector for each job lost in the container and the container support industries.<sup>1</sup>

On an equivalent employee basis, where the average annual compensation for each group of employees is used to establish the weighting system, the annual wage levels of production workers in the container (and container support) industries would have to be in excess of four times the annual compensation of the distribution workers before the positive employment generation results of the RTI study could be overturned.

On a job-for-job basis, irrespective of the annual level of compensation for each employee category, the results of a mandatory deposit system (MAND (RET)) are overwhelmingly job creative, according to the RTI study.

D. Summary

When mandatory deposit systems, with consumer return to retail stores, have been evaluated in the United States, the definitive conclusion is that their introduction would be job creative and employment positive.

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<sup>1</sup> The employment impact on the container support industries was defined as indirect employment in the present study.

X

SUMMARY OF FINDINGS

The principal findings from this employment model are summarized in this section.

1. When the direct and indirect employment effects are integrated, net employment increases are predicted in the first year for each of the five primary policy alternatives.
2. When only the direct employment effects are evaluated, net employment increases are also forecast in the first year for each of the five primary policy alternatives.
3. The greatest net employment gains in the first year (either for the overall net employment impact or for the net direct employment impact) occur in the two policy alternatives which require the largest container shift from single drink cans to single drink refillables; concomitantly, these two policy alternatives would cause the largest level of unemployment in the metal container industry. These programs are BAN and MAND (RET).
4. In the two phased policy alternatives (POL PACK and BAN (PH)), there is a distinctly smaller but definite net increase in employment expected (both for the overall employment and for the direct employment assessments). Additional employment adjustments would continue in the future years for each of these programmes.

Comment:

- (a) In the first four findings, a job-for-job weighting system is used. The fact that some job categories are accorded higher skills and higher levels of annual compensation has not been reflected in these conclusions.

- (b) The estimates of the direct employment adjustments (those which occur in the two container industries and in the retail stores and carbonated soft drink companies associated with the distribution sector) have a higher degree of accuracy than estimates of the indirect employee impacts.
- (c) The number of job losses forecast would be greater than the actual employment losses or lay offs in the container (and the container support) industries because of market growth and attrition: i.e., some employees would be relocated in the same plant or company although their original job had been withdrawn.
- (d) The first year employment impacts for the government's policy package (POL PACK) are still unambiguously job creative when changes in trippage and methodology are evaluated. This conclusion holds both for the direct employment and the overall employment impacts. The substitution of the Folk methodology (with or without a possible retail handling charge) for the productivity method indicated that significantly more jobs would be derived in the distribution sector.

5. Production worker job losses in the container industries refer to relatively skilled, high income wage earners. These job losses would be concentrated in a small number of urban areas where the container plants exist. The job increases in the distribution sector relate to low skilled, low wage employees who would be hired in regions across the province.

Comment

Most employment impact studies associated with the environmental effect of beverage container legislation make no serious efforts to distinguish between different average compensation levels for employment losses or gains.

Annual compensation levels were not available for each job element and therefore a weighted average computation of job gains and losses was not derived.

Even if a \$10,000 job by one employee in a city is to be replaced in the gestation period by a \$10,000 job for another employee, there are still additional social costs to be recognized for those who become unemployed which are not measured in this apparent one-for-one job transformation.

6. Under each policy alternative, the total number of production work job losses in the two container industries is almost identical, although the distribution between these two industries is a function of the expected market shift from cans to single drink refillables required by each policy alternative.

Comment

This arises as a first year employment impact because the largest loss in production worker jobs forecast for the glass container industry (618) jobs under MAND (DEP), IND PROG, and TWO CENTAX is by coincidence, almost exactly the total (613 jobs under BAN) of the largest job loss forecast for metal container production workers.

7. According to estimates presented from the Glass Container Council of Canada, the majority of the expected job dislocations under POL PACK has already been experienced. The unemployment estimates presented in this report have not been adjusted to reflect the unemployment that has already occurred in the glass container industry.

Comment

- (a) In the first year employment impact, the government's policy package would be expected to cause a very small number of additional job losses in the glass container industry.

Some job losses would also be expected in the metal container industry.

(b) The results in Table E3 indicate that when the government's three-year programme has been completed, there is a relatively small additional job dislocation expected during each of these years. The job dislocation totals in Tables E1 to E3 do not include possible adjustments for industrial growth and attrition. The existing job lay offs identified in this finding have not been reflected in the totals of Table E3.

(c) The results in Table E3 also indicate that for the government's policy package the job dislocation estimates are spread between the two container industries by the end of the three year transformation period.

8. Employment studies in other jurisdictions confirm that policy action of throwaway beverage containers is job creative.

Comment

The most recent and comprehensive research which examined the introduction of a mandatory deposit system (MAND (RET)) for all carbonated soft drink containers (refillable bottles and cans) over a five year phased period for the entire United States, showed very positive job creation attributes. This study forecasts that four jobs in the distribution system would be created during this transformation period for each production worker job loss.

9. Before a final evaluation on policy alternatives is possible, the results of the employment model must be integrated with the complementary assessment of the environmental and other goals established by the government for carbonated soft drink packaging in Ontario.

XI

FINAL COMMENTS

The primary goal of the government's integrated policy programme on carbonated soft drink packaging is to achieve environmental gains in solid waste, energy, non-renewable resources and litter.

The method of attaining these environmental gains is to require container substitution from cans and throwaway bottles to refillable bottles at reasonable trippage levels. Comitant with this transformation are the employment impacts estimated in this report. The government's policy in the economic arena is to attain these environmental gains under a phased adjustment programme which mitigates the job dislocation in the container production industries. Overall, the government's policy package will be job creative.

With emphasis on the employment sector, particularly when an unusually high unemployment exists in Ontario, the study has presented the employment adjustments which would be expected for seven policy alternatives, including the government's policy package. However, the employment impacts presented in this study must be integrated with the environmental impacts associated with each policy alternative before a final assessment is made.

However, given the level of job dislocation which has already been reported in the glass container industry, and given the intention to significantly reduce the market share of carbonated soft drinks sold in cans, the government's integrated policy package, which includes the five cent can tax, with its phased approach, would cause fewer additional job losses than any of the alternative policy options.

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## BIBLIOGRAPHY

- 1 Folk, Hugh, Employment Effects of the Mandatory Deposit Regulations - State of Illinois Institute for Environmental Quality, Springfield, Illinois, November 1972
- 2 Government of Ontario, Ministry of the Environment, General Report of the Solid Waste Task Force to the Ontario Minister of the Environment, 1974, Volume 2, Part IV, An Environmental Study of Beverage Packaging
- 3 Nadworny, Milton, J., Some Economic Consequences of the Vermont Beverage Container Deposit Law, University of Vermont, February 1975
- 4 Research Triangle Institute, Energy and Economic Impacts of Mandatory Deposits, Federal Energy Administration, Office of Energy Conservation and Environment, Washington, D.C., September 1976
- 5 State of Oregon, Dept. of Environmental Quality - Oregon's Bottle Bill: The 1977 Report, Portland, Oregon, 1977

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